

FIG. 1 is a schematic diagram of a prior art optical system. The system includes a light source 10, a lens 20-S, a lens 20-1, a lens 40-1, a lens 40-m, a lens 50, a lens 51, a lens 65, and a lens 65-n. The light source 10 emits light with wavelength  $\lambda_1 - \lambda_n$ . The light passes through the lens 20-S, then the lens 20-1, then the lens 40-1, then the lens 40-m, then the lens 50, then the lens 51, then the lens 65, and finally the lens 65-n. The light is focused on a target 1.

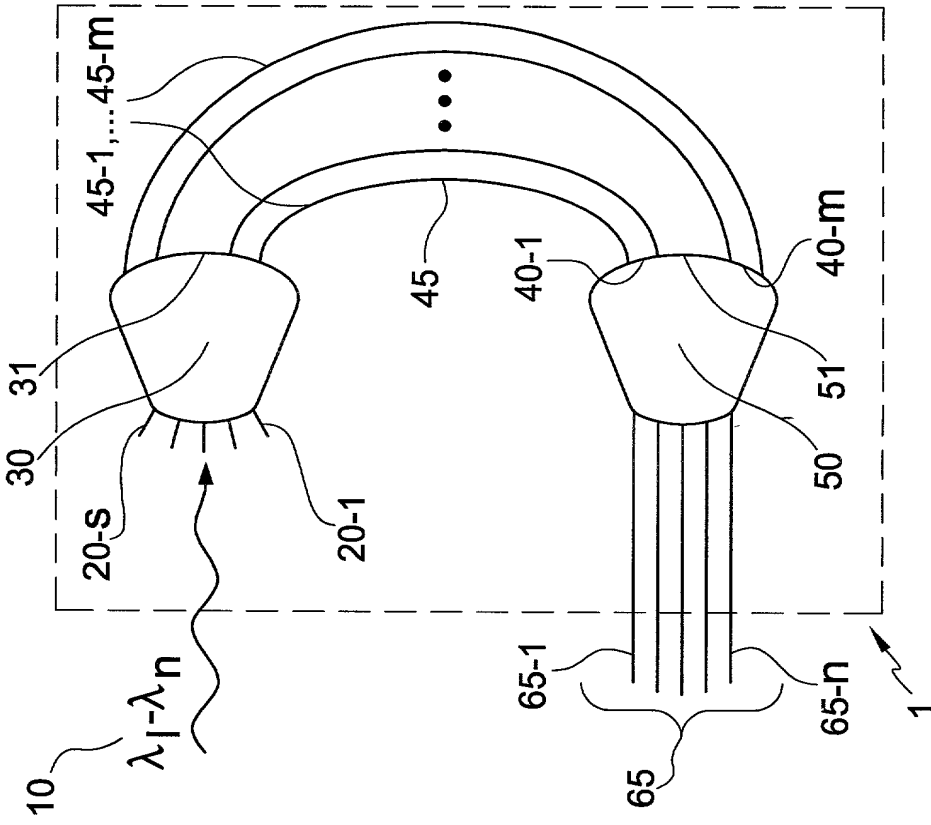


FIG. 1  
(PRIOR ART)



FIG. 3 is a block diagram of a system 100. The system 100 includes a light source 110, a beam splitter 130, a series of waveguides 121-1, 121-2, ..., 121-m, a series of detectors 145-1, 145-2, ..., 145-m, and a controller 170. The light source 110 emits light with wavelengths  $\lambda_1$  to  $\lambda_n$ . The beam splitter 130 splits the light into two paths. One path goes through the waveguides 121-1, 121-2, ..., 121-m to the detectors 145-1, 145-2, ..., 145-m. The other path goes through the beam splitter 130 to the detectors 145-1, 145-2, ..., 145-m. The controller 170 is connected to the waveguides 121-1, 121-2, ..., 121-m and the detectors 145-1, 145-2, ..., 145-m.

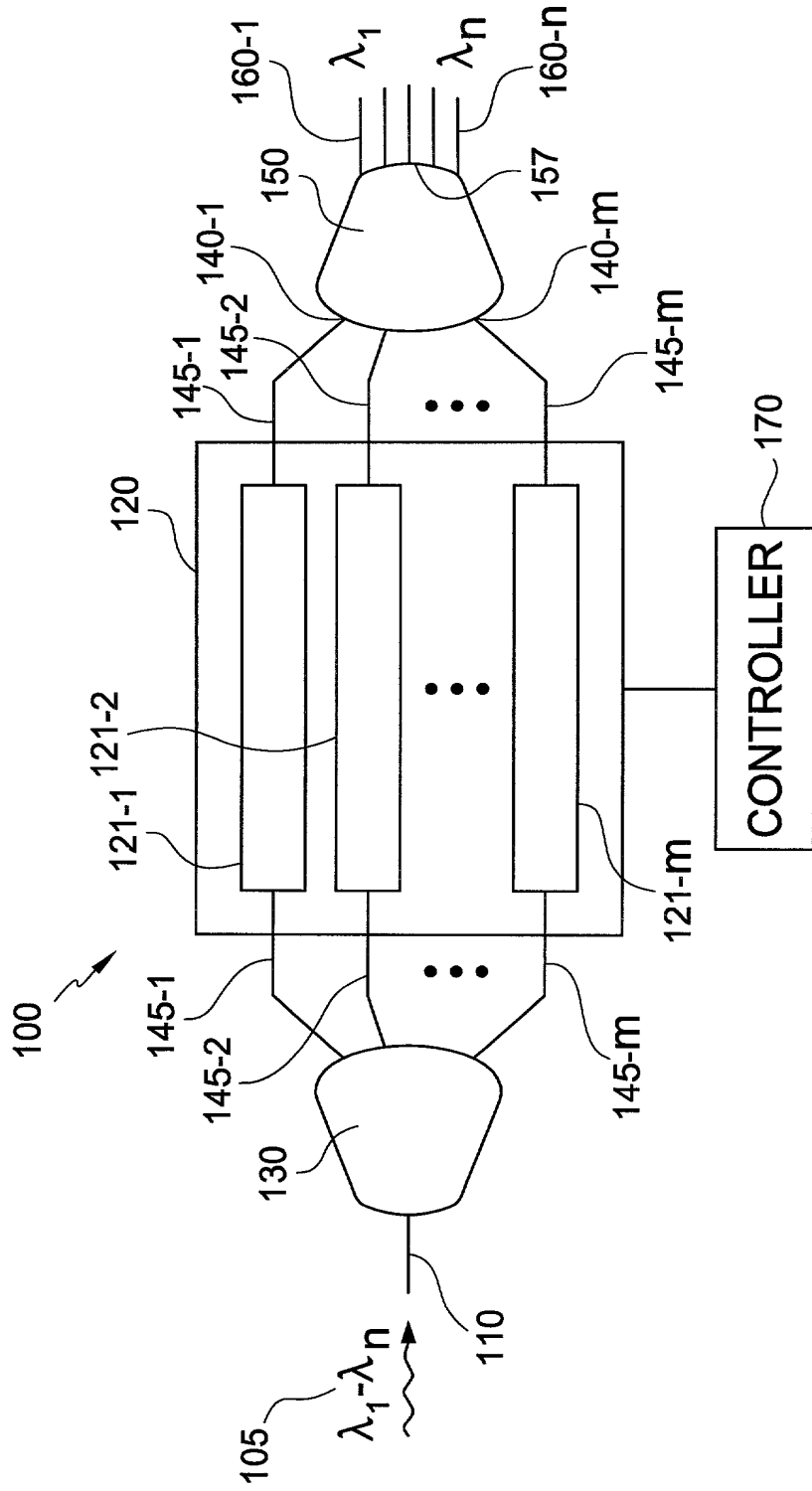
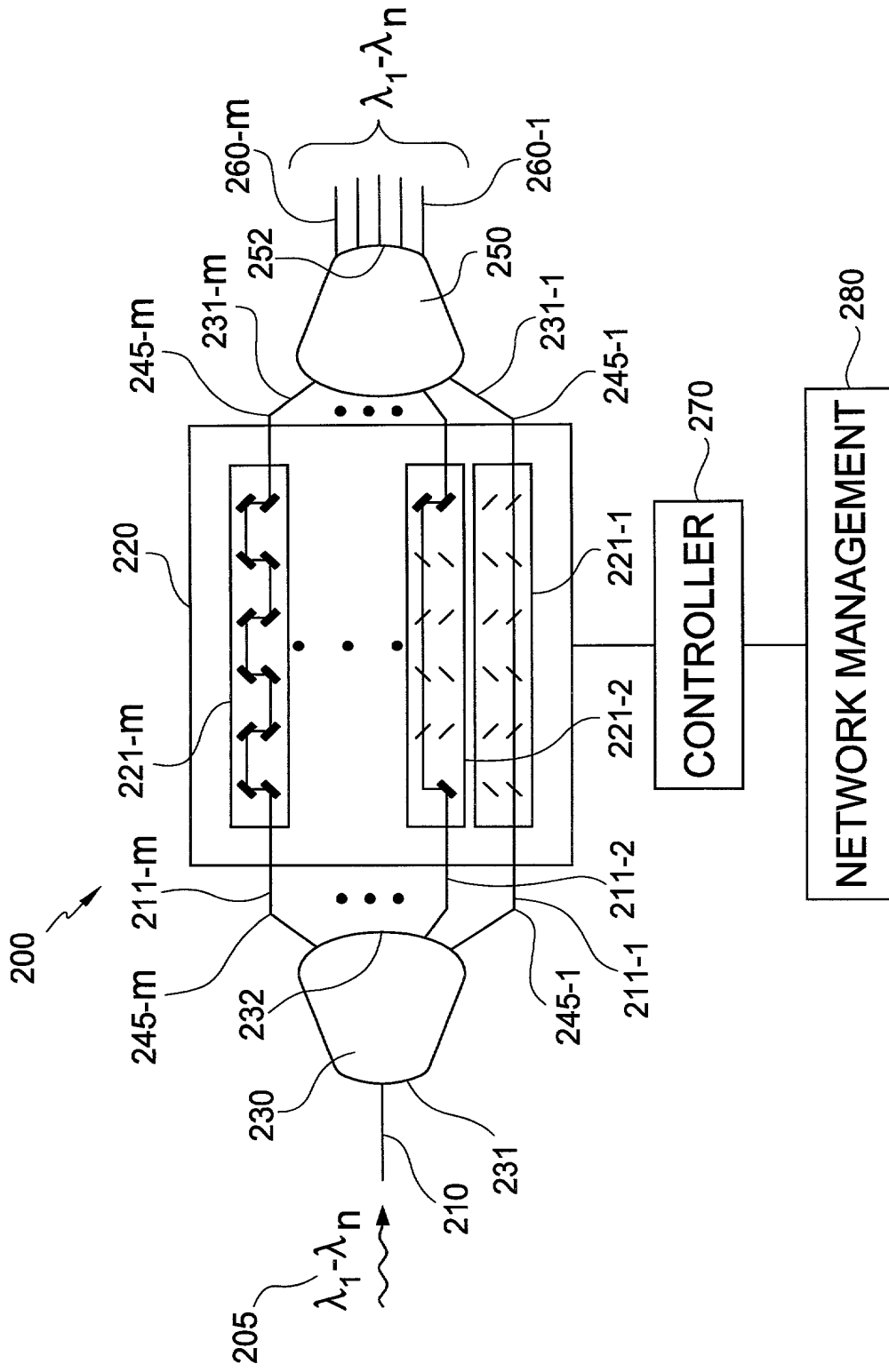


FIG. 3



**FIG. 4**

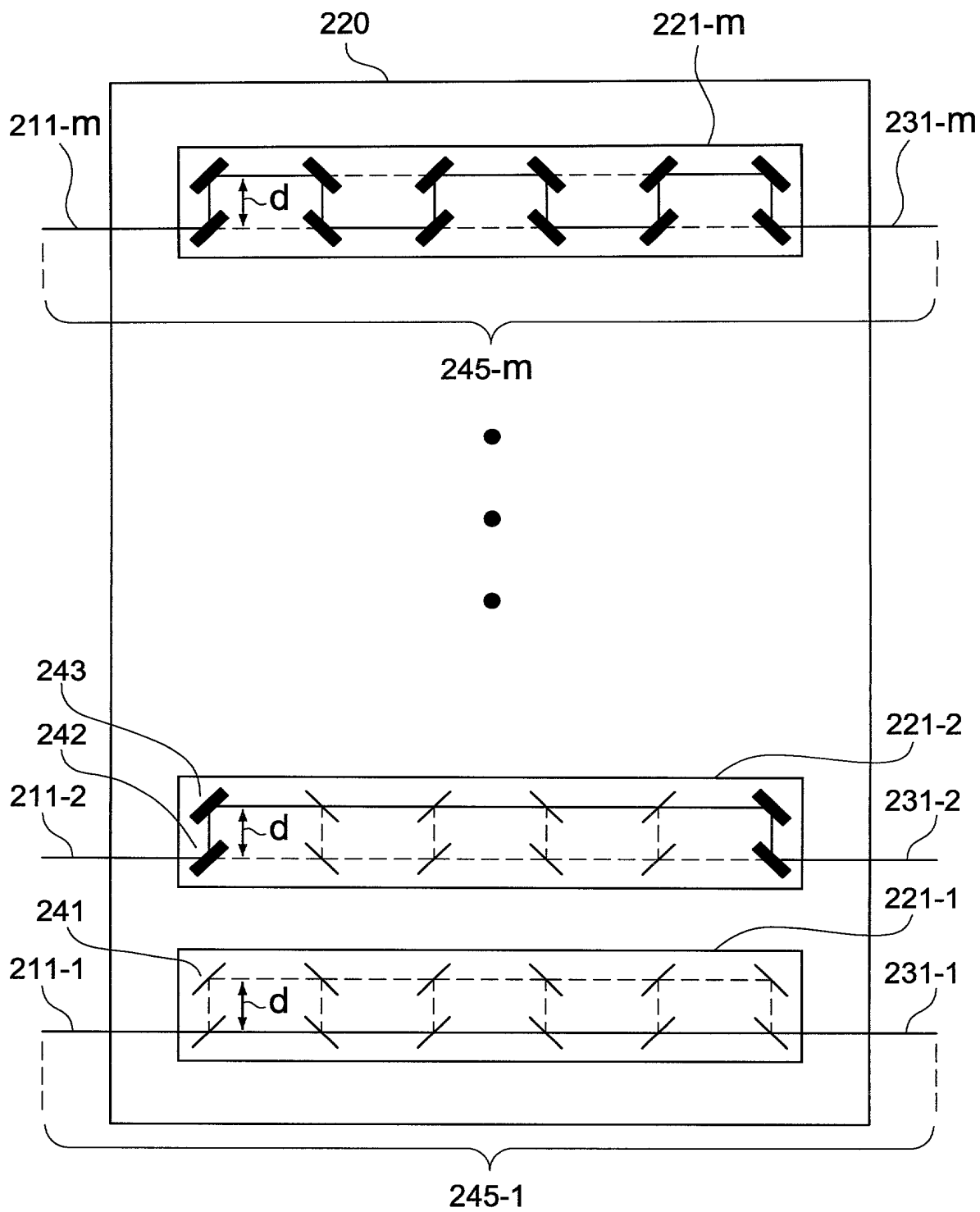


FIG. 5



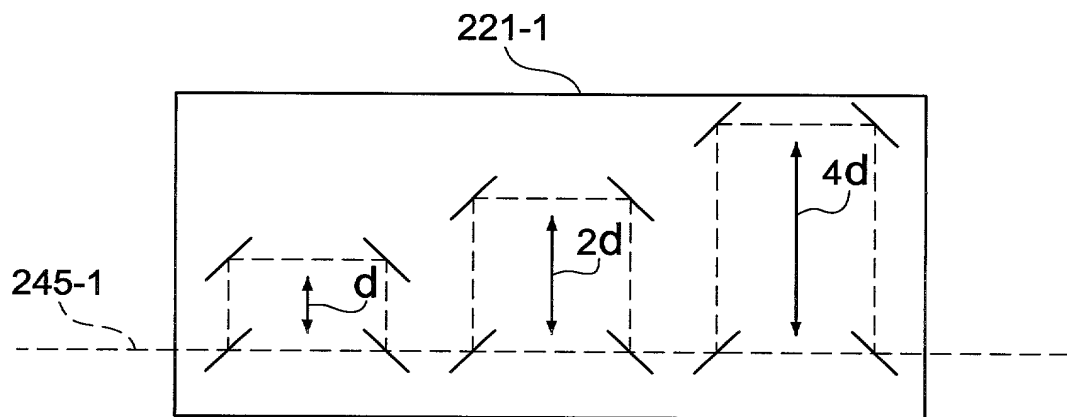


FIG. 8

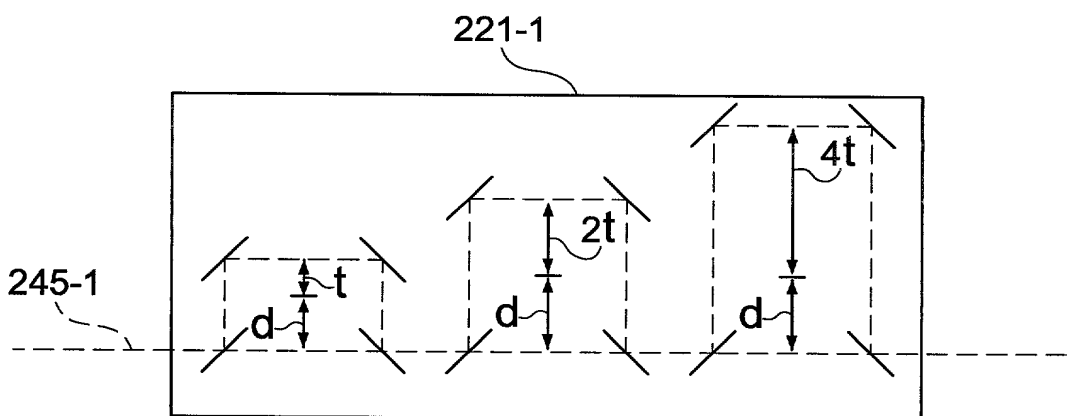


FIG. 9

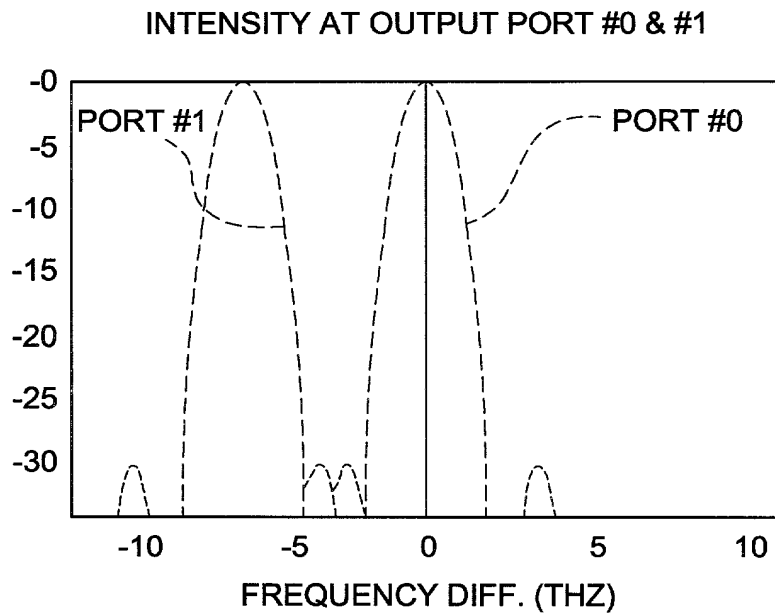


FIG. 10A

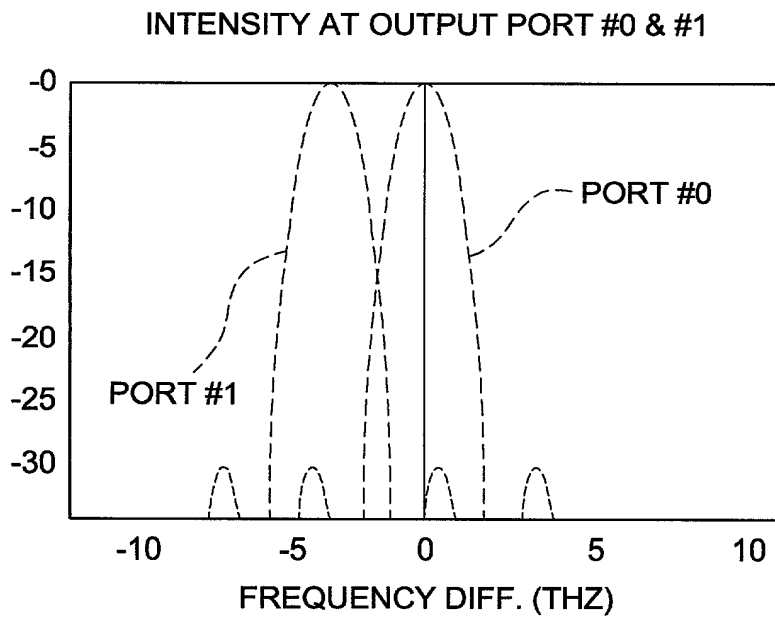


FIG. 10B



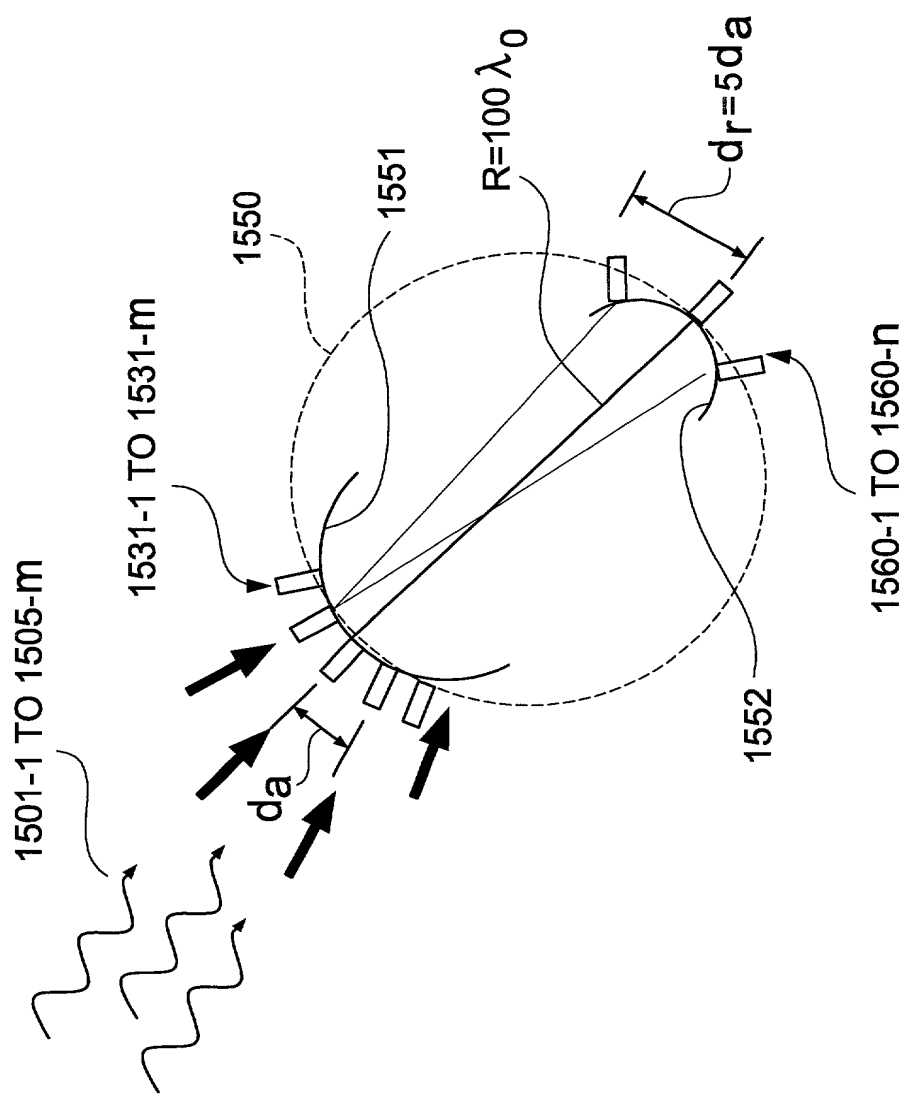


FIG. 11

FIG. 12 is a schematic diagram of a device 320, which includes a substrate 321, a first layer 322, a second layer 323, and a third layer 324. The device 320 is shown in a cross-sectional view, with the layers 321, 322, 323, and 324 stacked vertically. The layers 322, 323, and 324 are shown with dashed lines, indicating they are not to scale. The layers 322, 323, and 324 are separated by a distance 'd'. The layers 322, 323, and 324 are shown with a pattern of diagonal lines, indicating they are not to scale. The layers 322, 323, and 324 are shown with a pattern of diagonal lines, indicating they are not to scale.

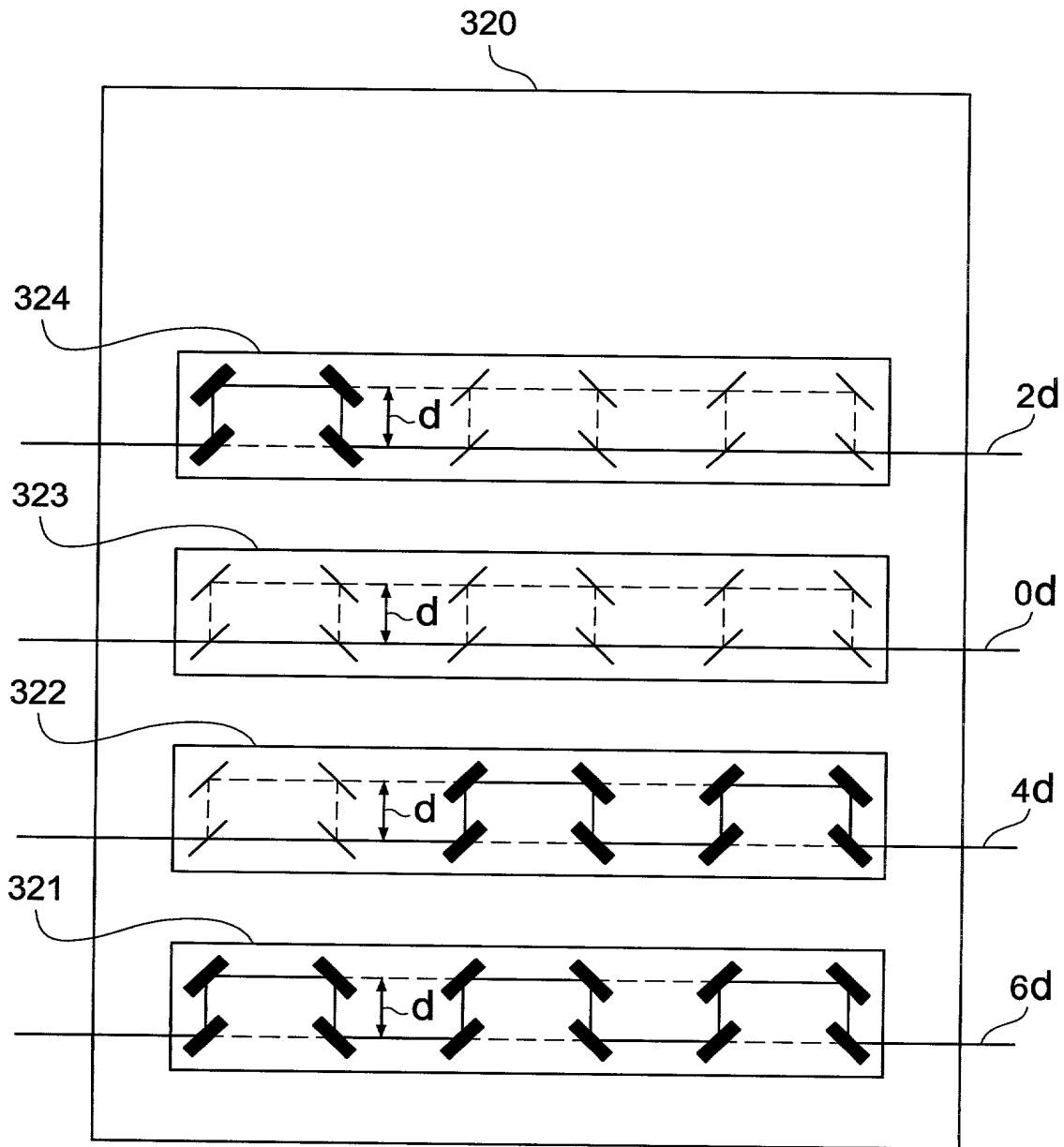


FIG. 12

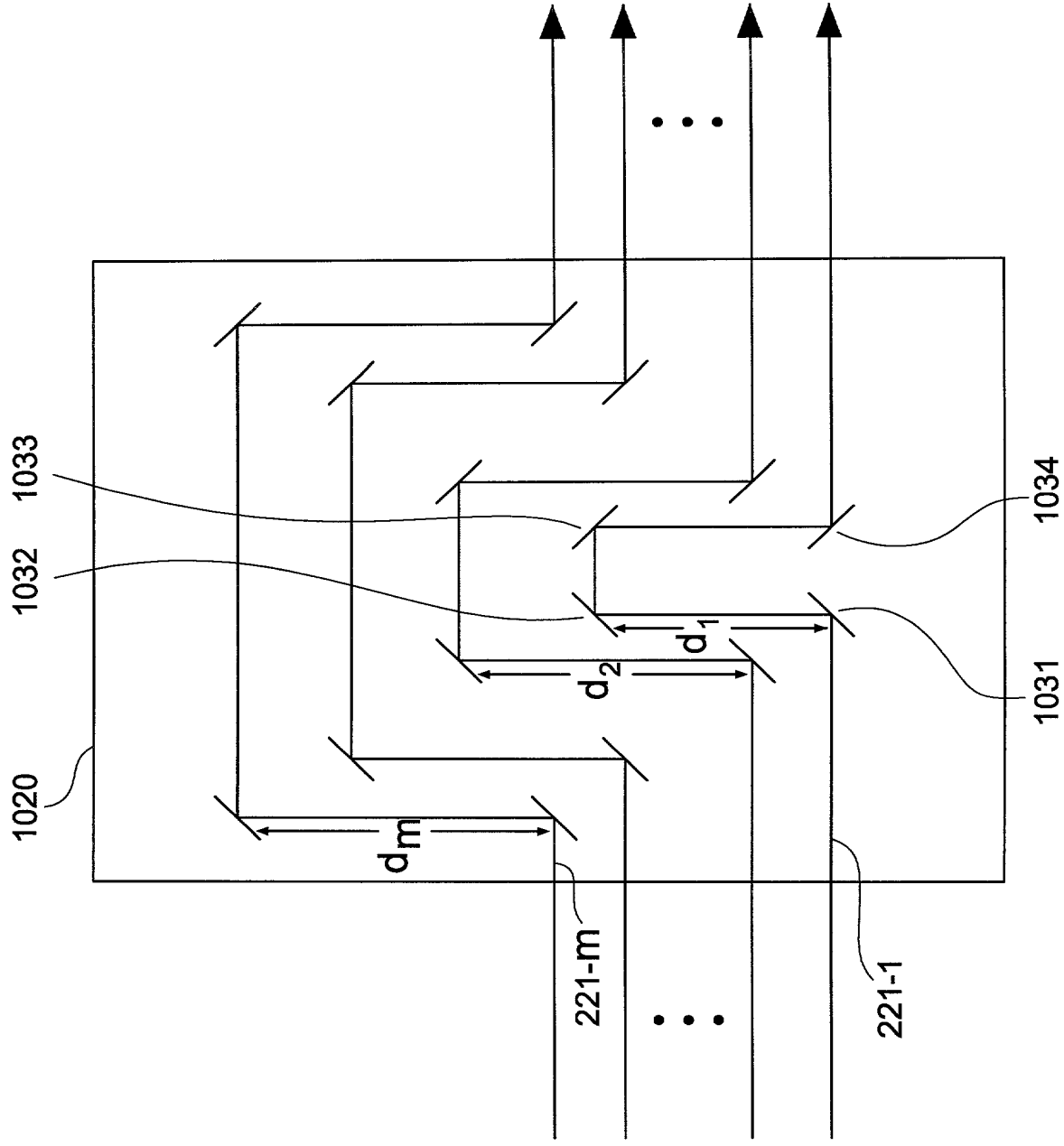


FIG. 13

FIG. 14 is a perspective view of the device 900, showing the array of sensors 940 and the controller 970. The device 900 is shown in a perspective view, with the array of sensors 940 and the controller 970. The array of sensors 940 is shown in a perspective view, with the controller 970. The array of sensors 940 is shown in a perspective view, with the controller 970.

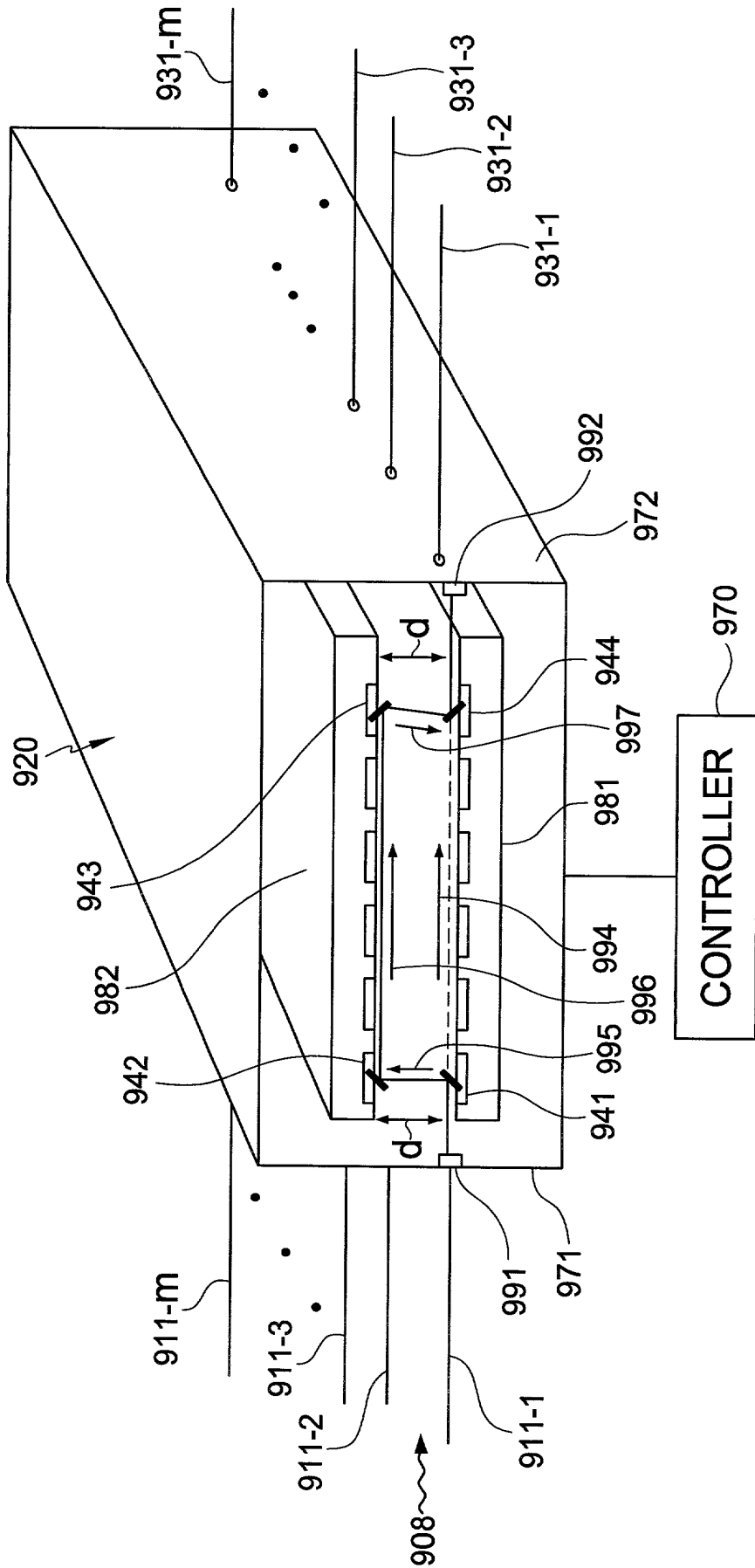


FIG. 14

1200 1208 1211-1 1211-m 1210-1 1210-2 1210-p 1214 1220 1221 1217 1216 1230 1219 1215 1218 1270

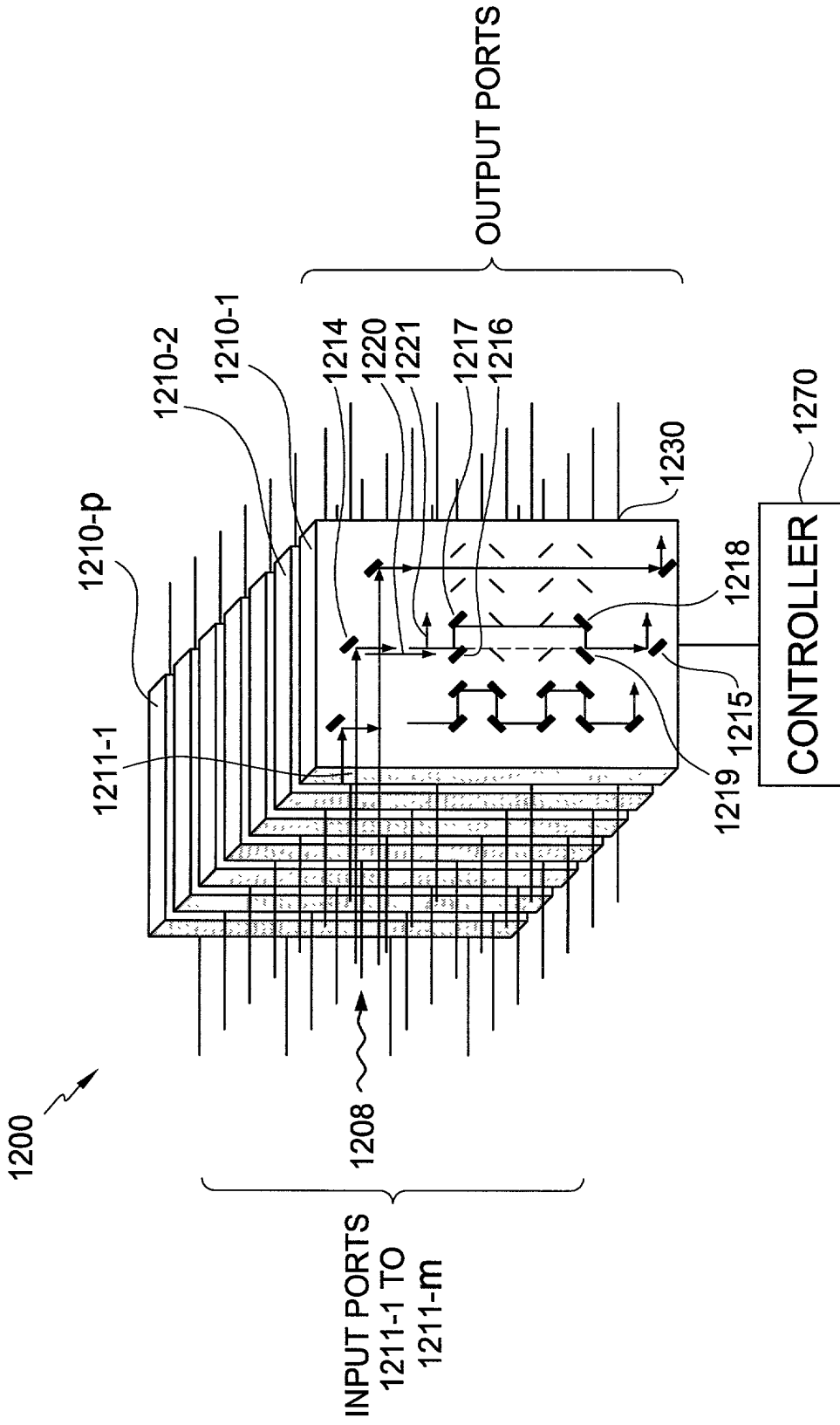


FIG.15

FIG. 16 is a perspective view of a system 1300 including a first array 1310 and a second array 1320. The first array 1310 includes a first set of elements 1311 and a second set of elements 1312. The second array 1320 includes a third set of elements 1321 and a fourth set of elements 1322. The first array 1310 and the second array 1320 are connected to a controller 1370 via a bus 1316. The first array 1310 is connected to the controller 1370 via a first set of lines 1313 and a second set of lines 1314. The second array 1320 is connected to the controller 1370 via a third set of lines 1323 and a fourth set of lines 1324. The first array 1310 and the second array 1320 are connected to the controller 1370 via a first set of lines 1313 and a second set of lines 1314. The second array 1320 is connected to the controller 1370 via a third set of lines 1323 and a fourth set of lines 1324.

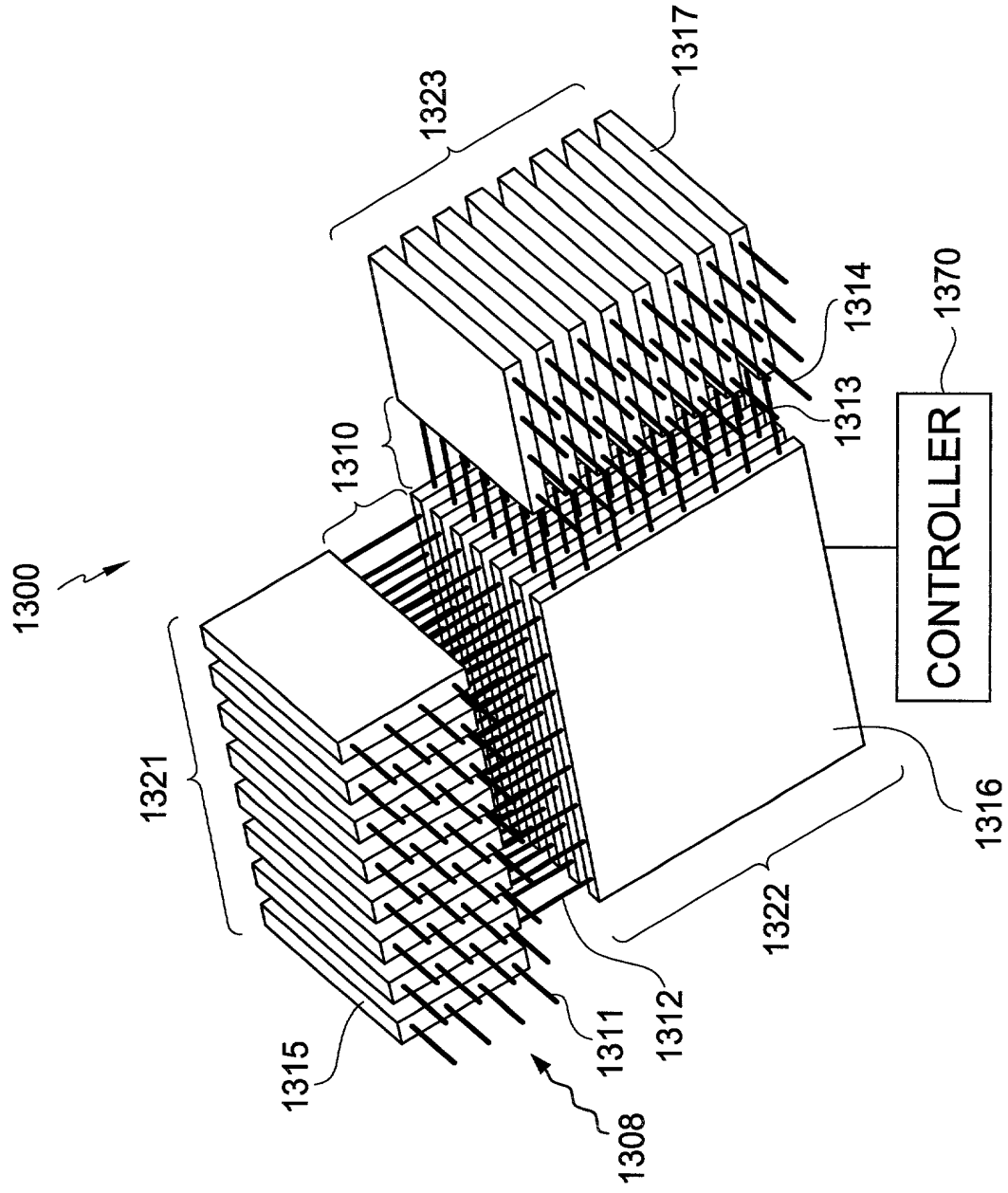


FIG. 16

FIG. 17 is a schematic diagram of a device 1400. The device 1400 includes a substrate 1410, a layer 1420, and a layer 1430. The layer 1420 includes a first portion 1420-1, a second portion 1420-2, and a third portion 1420-m. The layer 1430 includes a first portion 1430-1, a second portion 1430-2, and a third portion 1430-m. The device 1400 is configured to receive incident light 1405 with a wavelength range  $\lambda_1 - \lambda_n$  and to emit light 1460. The device 1400 is also configured to emit light 1450.

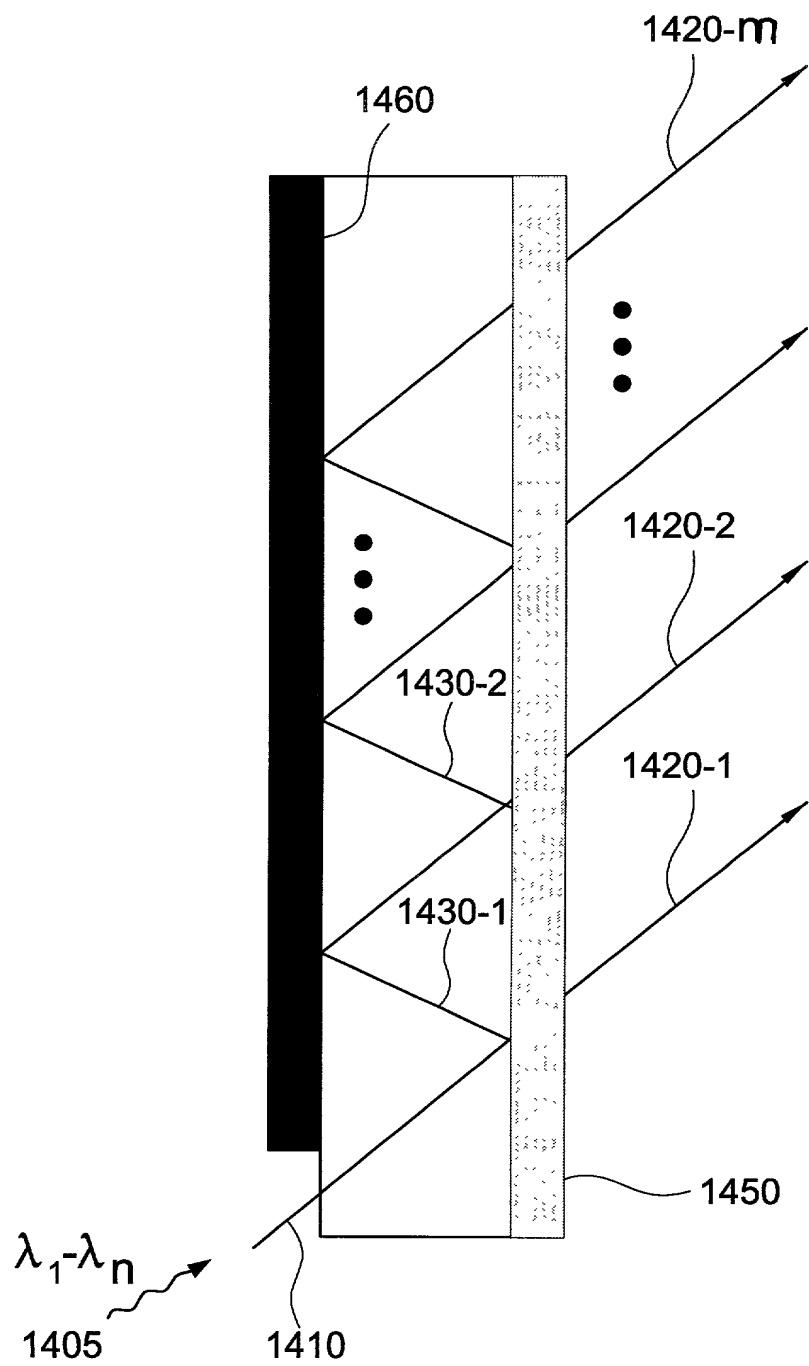


FIG. 17

FIG. 18 is a schematic diagram of a device 400, showing a top view of a rectangular substrate 420. The substrate 420 contains a central rectangular region 422, which is surrounded by a rectangular frame 421. The frame 421 is composed of two parallel horizontal bars 423 and two parallel vertical bars 424. The horizontal bars 423 are connected to the vertical bars 424 by four diagonal bars 425. The device 400 includes two input/output ports, labeled  $\alpha$  and  $\beta$ , located on the right side of the substrate 420. Port  $\alpha$  is connected to a terminal 453, and port  $\beta$  is connected to a terminal 451. The terminals 453 and 451 are connected to a common ground line 433. The device 400 also includes a central rectangular region 422, which is surrounded by a rectangular frame 421. The frame 421 is composed of two parallel horizontal bars 423 and two parallel vertical bars 424. The horizontal bars 423 are connected to the vertical bars 424 by four diagonal bars 425. The device 400 includes two input/output ports, labeled  $\alpha$  and  $\beta$ , located on the right side of the substrate 420. Port  $\alpha$  is connected to a terminal 453, and port  $\beta$  is connected to a terminal 451. The terminals 453 and 451 are connected to a common ground line 433.

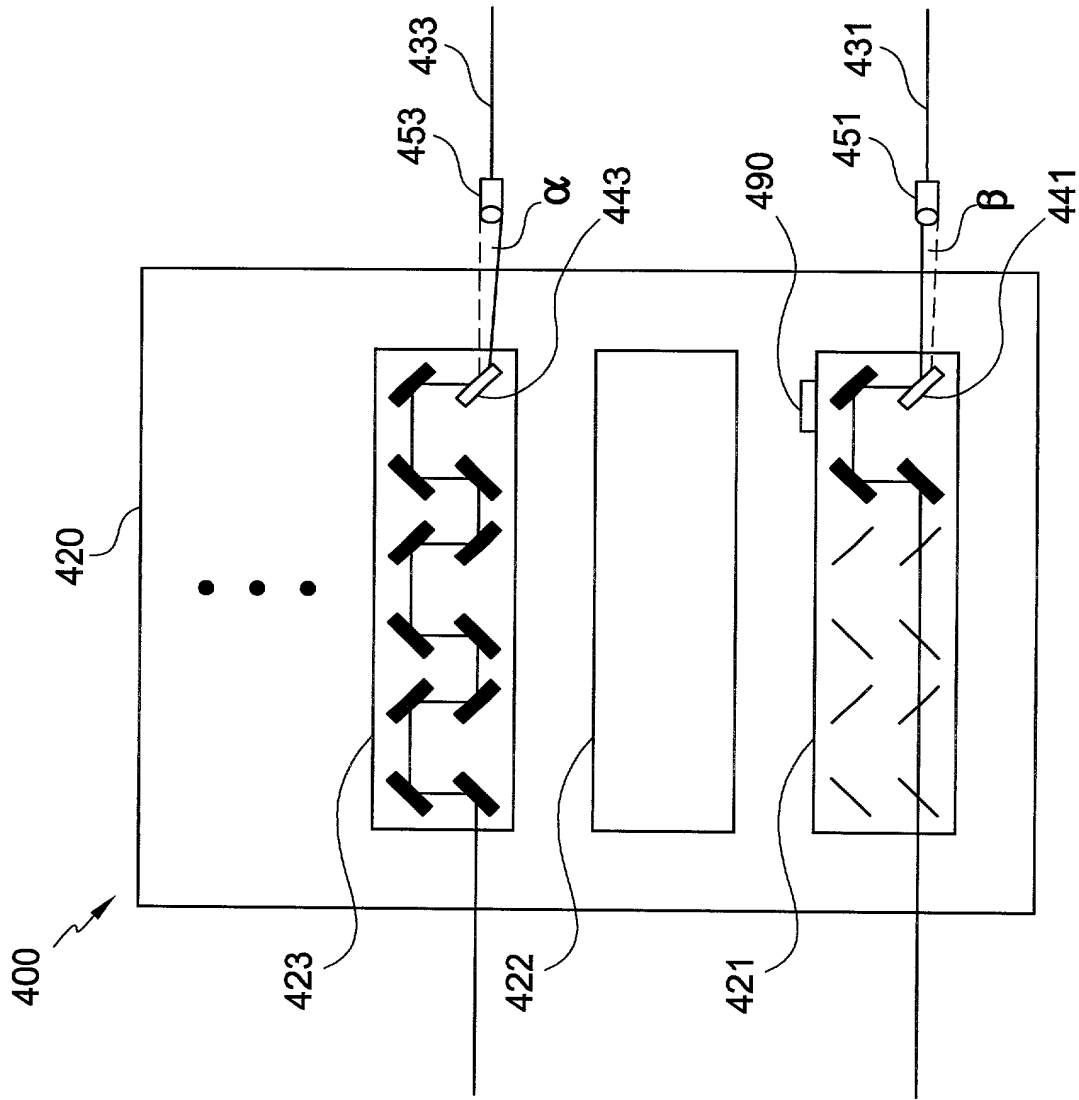


FIG. 18